

Invasive Alien Species: A Threat To Biodiversity

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BIODIVERSITY provides essential resources and goods such as food, fibre and medicines. It provides humans and animals with other vital services such as the regulation of water levels and flow, protection against extreme weather, purification of air, prevention of soil erosion and opportunities for recreation and spiritual reflection. Naturally, biodiversity is the base for life on earth and one of the pillars of sustainable development. Environment rich in biodiversity is resilient when struck by natural disaster. However, these days biodiversity is being lost at an unprecedented rate.

The green crabs, the African tulip tree and Mikania sp., Lantana sp. and Eupatorium sp. are just a few of the many plant and animal species whose unchecked population growth outside of their native habitats have severely impacted native species, the functioning of ecosystem, and global and local economies.

The biological invasion by alien species is now recognized as one of the major threats to native species and ecosystems. The term invasive species denotes plants and animals, which have been introduced into ecosystem where they are not native by either intentional or unintentional human activity. They adversely affect

the habitats they invade economically, environmentally or ecologically. Over the last one decade human beings have caused a change in the global ecosystem faster and more extensively than in any period in human history leading to an unprecedented loss of biodiversity.

Biological diversity faces many threats throughout the world. One of the major threats to native biological diversity caused by invasive alien species (IAS) is the damage or replacement of native animal or plant population as well as the health of our ecosystem.

All of the threats to Nepal's biodiversity, which are due to the activities of human beings are habitat destruction and over exploitation accompanied by the introduction of exotic species leading to habitat change and soil degradation.

The wide range of habitats and environmental conditions make Nepal especially vulnerable to the invasive species of foreign origin. Potential invasive alien species from most areas of the world may find suitable habitat somewhere in Nepal. In recent years, the invasive species have gained considerable notoriety as major threats to native species and ecosystem.

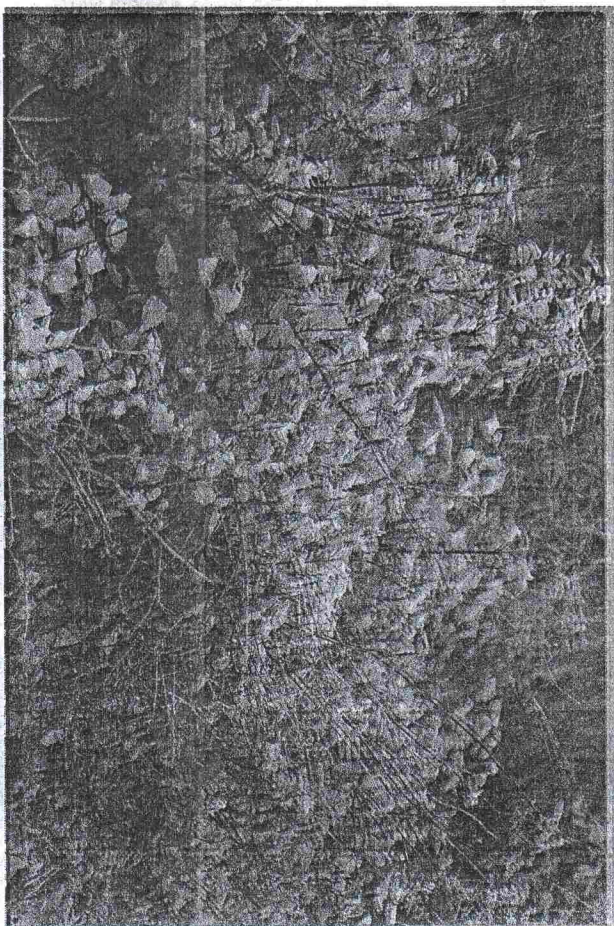
Introduction of plants from one place to another may be natural or planned. Accidental and intentional

introduction by gardeners, traders, plant lovers and researchers have contributed to the growth of a large number of exotic plants in Nepal. Indeed, the country has a long history of introduction of non-native species, especially the species proven to be productive elsewhere by offering potential economic benefit to the country.

Tamarindus indica (Imali) originally from Africa is believed to have been first introduced into Turkey and it gradually spread towards China along the Silk Road. Now it is naturalized in Nepal. In the 19th century, the British were major contributors, bringing economically important plants from almost every continent. Some of the alien tree species such as Tectona grandis (Teak) and Albizia spp (Siris) were introduced for the timber potential or for the watershed protection. In the 20th century the country's economic development including growth in trade and transportation systems multiplied the avenues of introduction and spread of invasive species. New species such as Leucaena leucocephala (Ipil Ipil), Eucalyptus camaldulensis (Masal) Acacia auriculiformis and Cassia occidentalis (Chakor) are becoming popular.

Some common fruit trees, including Litchi chinensis (Lichi), Ananas cosmos (Pineapple) and Cocos nucifera (Coconut) were also introduced. Similarly vegetables such as Cucurbita sp. (Cucurbits), Raphanus sativus (Radish), Solanum tuberosum (Potato) and Daucus carota (Carrot) came from other countries and have been welcomed by Nepalese farmers. Likewise, Eupatorium sp., Lantana camara, Eichhornia crassipes were first introduced as ornamental plants and they are now well established and dominant in forest, farmland, wetland and wasteland.

Introduction of species beyond their natural range are rising sharply because of increase in trade, transport, travel and tourism activities. These provide vectors and pathways for plants, animals. Most of the alien species do not become invasive or do not cause problems in their new locations. Many have great benefits to



Photos: Shekhar Chauhan

the society, for examples in agriculture, horticulture, forestry and aquaculture as mentioned above.

Biological invasion worldwide threatens biodiversity, ecosystem dynamics, resources availability, national economy and human health. It is a pervasive and costly environmental problem. However, the subsets of alien species that do become invasive have adverse environmental impacts

include Eichhornia crassipes (Water hyacinth), Eupatorium sp (Banmara) and Mikania sp. (Lahare banmara or mile a minute). These plants are considered the most notorious alien plant species common in our forests and wetlands. Similarly, invasive giant African snail provides an intermediate host for rat lungworm, which can infect the human brain causing paralysis, coma and even death. Dense stand of alien plants also have a major impact on catchments hydrology. These species lowers about 30-70 percent water from watershed areas. Most of

them are detrimental to the invaded systems and threaten the sustainable functioning of important ecosystem services. The reduced stream flows obviously has devastating impact on aquatic biota. It can also disrupt stock watering, irrigation, tourism and recreational use of resources and heritages.

Although impacts of biological invasion may be local, the cause of introduction is mostly international. These plants can be introduced through movement of goods and people, shipping and boating, agricultural and forestry, horticulture, habitat restoration and land escaping, by canal, Mari culture and aquaculture.

The spread of alien species is creating complex and far-reaching challenges that threatens both the natural biological niches of the earth and as well as well being of its citizens. The convention of Biological diversity has recognized the proliferation of invasive alien species as emerging

issues noting that IAS introductions are one of the main recorded causes of biodiversity loss and cause serious damage to environment, economy and health.

Giving emphasis to this, this year International Day for Biological Diversity is being celebrated today (May 22) under the theme of 'Invasive Alien Species'. It is now well accepted that the control of invasive species is not possible through a short-term or single effort; it requires detailed survey, monitoring and research. Biological conservation cannot be achieved through the efforts of government alone but needs the public participation and support. Another method of controlling these species is by biological pest and organism. The profuse use of native species should be encouraged instead of alien species in nurseries, botanical gardens and government forests.

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